

**EDOVUM PUTTLERI, N. G., N. SP. (HYMENOPTERA:  
EULOPHIDAE), AN EGG PARASITE OF THE  
COLORADO POTATO BEETLE  
(CHRYSOMELIDAE)**

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*Abstract.*—*Edovum puttleri*, new genus, new species, is described and illustrated from material reared from eggs of *Leptinotarsa undecimlineata* (Stål) from Colombia, South America. This egg parasite has been successfully reared on eggs of the Colorado potato beetle (*L. decemlineata* (Say)) in the laboratory.

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In February and March of 1980, Ben Puttler (USDA, ARS, Biological Control of Insects Research Unit, Columbia, Mo.) made a search in Colombia, South America, for potential natural enemies to use against the Colorado potato beetle, *Leptinotarsa decemlineata* (Say). An egg parasite of the related species *L. undecimlineata* (Stål) had been found and referred to in the literature as *Emersonopsis* species (Puttler, personal communication). Puttler rediscovered this parasite in Colombia and submitted it to me for identification. Superficially this wasp resembled species of the genus *Emersonopsis* (host unknown), but biologically it behaved like species of *Emersonella*, a group of egg parasites of Chrysomelidae. After considerable study, however, I still could not definitely place the specimen to genus, so I sent it to Zdenek Bouček (British Museum Natural History) for his opinion. He suggested that this eulophid wasp belonged to an undescribed genus. After additional comparison with about 40 entedontine genera in the collection of the U.S. National Museum and after personal discussion with Bouček, I am describing the material as a new genus and species. The name is needed at this time because of studies being conducted on the potential use of this parasite as a biological control agent for the Colorado potato beetle. Additionally, some thoracic characters are discussed which may help define future work in the entedontine eulophids.

EULOPHIDAE: ENTEDONTINAE  
*Edovum* Grissell, NEW GENUS

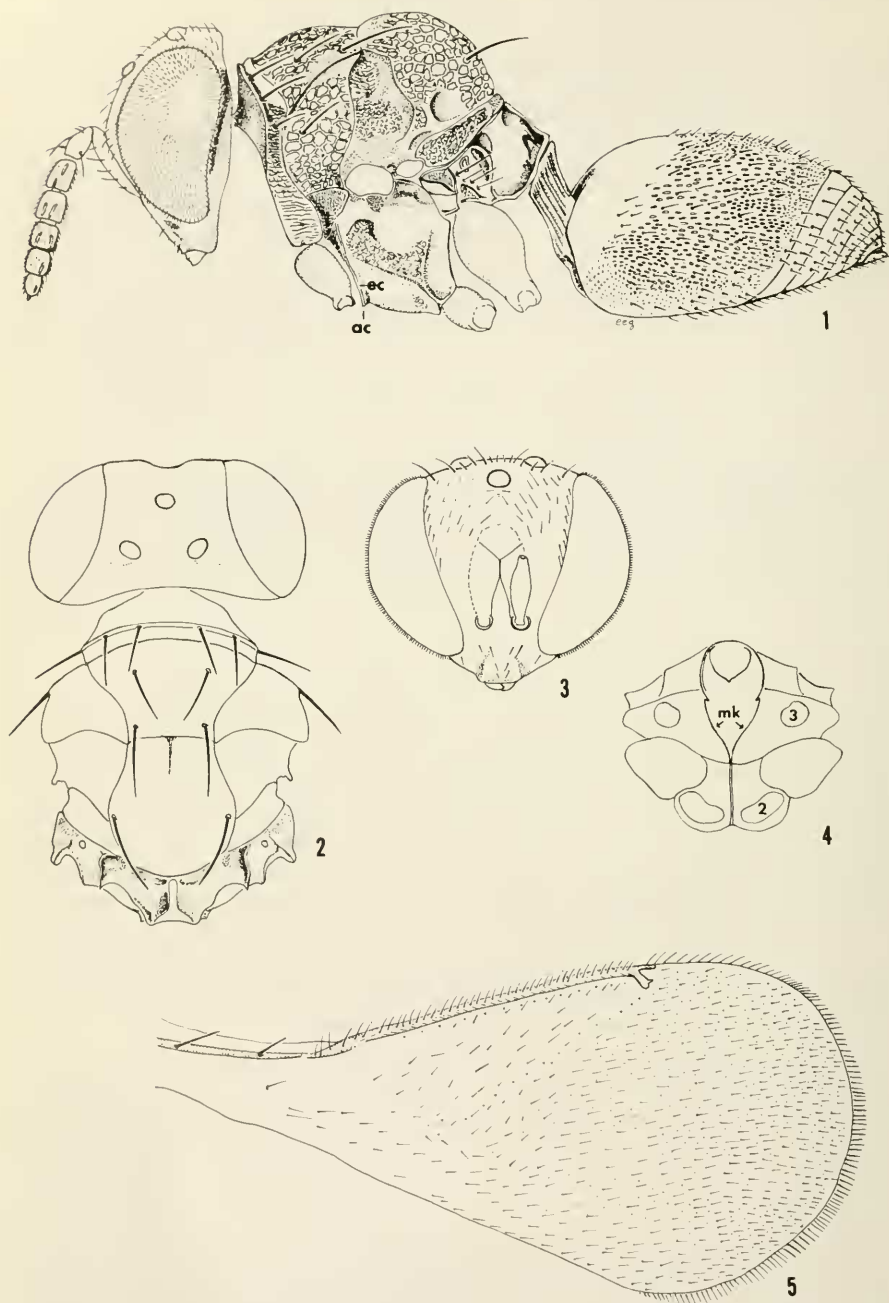
Type-species.—*Edovum puttleri*, new species.

Female.—Body heavily sclerotized, not collapsing when dry. Head without occipital carina, occiput meeting vertex at angle medially but not sharply defined, ocelli in nearly right triangle (Fig. 2), postocellus with posterolateral depression, face (Fig. 3) with eyes converging ventrally, toruli laterally closer to eye than to each other (1:2) and several diameters above lower margin of eye, scrobal grooves arising at inner margins of toruli meeting in upper  $\frac{1}{3}$  of scrobal basin at frontal groove which is V-shaped, mandible with 2 subequal denticles, antenna (Fig. 6) with 3 flagellomeres, club 2-segmented with apical spine, anellus inconspicuous, eyes densely setose. Pronotum carinate along anterior margin with 6 bristles arising from transverse groove; scutum with 1 pair of bristles submedially and 1 pair on hindmargin, sidelobe with lateral bristle, scutellum with 2 posterolateral bristles (Fig. 2), notaulus distinct for entire distance but posterior  $\frac{1}{3}$  at inner margin of less sculptured flattened area (thus easily overlooked in some views), slight median groove extending  $\frac{1}{3}$  length from base to apex of scutellum, thorax with distinct epicnemial (laterally) and acetabular (ventrally) carinae outlining forecoxal depressions, axillae not produced forward, metasternum (Fig. 4) with Y-shaped keel separating hindcoxae and merging with foramen of propodeum, propodeum (Fig. 2) with flattened median carina subtended by longitudinal depressions and laterally produced into projection in front of hindcoxa; wing (Fig. 5) with costal cell  $\frac{1}{2}$  as wide as submarginal seta, submarginal vein with 2 setae, marginal vein nearly  $2\times$  length of submarginal, postmarginal and stigmal veins subequal and reduced, apical wing fringe about length of stigmal vein; tibial spur formula 1:1:1, midtibial spur longest. Abdominal petiole elongate with ventral length at least  $2\times$  as long as minimum diameter (in side view) and longitudinally carinate, abdomen in side view (Fig. 1) ventrally flat, dorsally arched, first tergum  $\frac{3}{4}$  length of abdomen, nearly carapace-like, second tergum  $2\times$  length of tergum 3, terga 3-7 subequal, ovipositor not protruding.

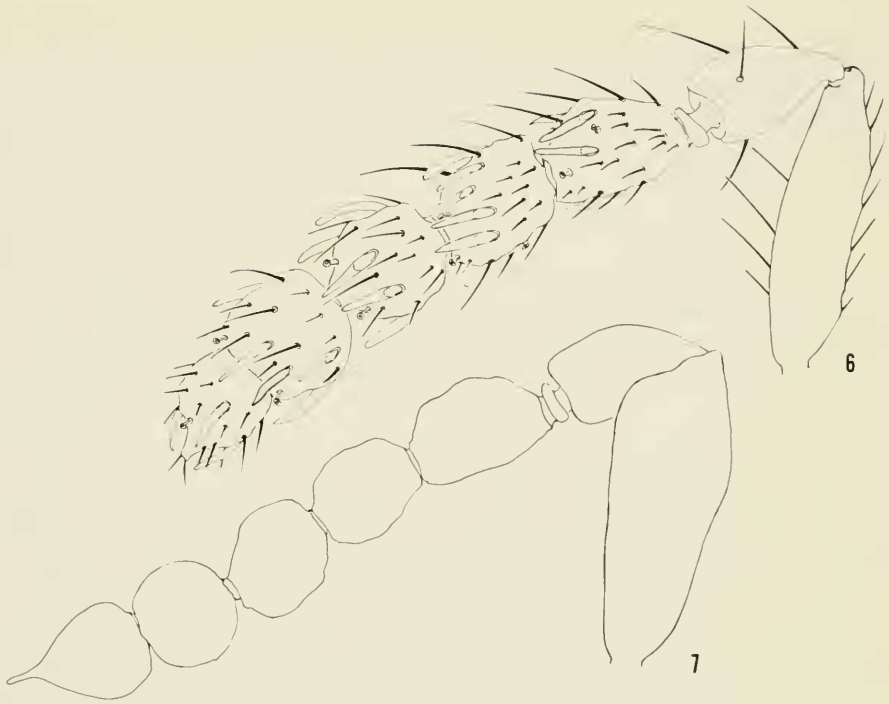
Male.—Differing from female by the following characters: Antenna (Fig. 7) with 4 flagellomeres, 1-segmented club, scape slightly expanded apicoventrally, last sternum rounded apically with slight circular depression medially.

Etymology.—*Edovum* from *edo*, L.—eat, plus *ovum*, L.—egg. Gender neuter.

Discussion.—*Edovum* belongs in the Entedontinae as defined by Peck et al. (1964). Within the subfamily this genus is distinguished from all other genera by the presence of an epicnemial carina connected ventrally with the acetabular carina (Fig. 1). Essentially this forms a mesosternal (forecoxal)



Figs. 1-5. *Edovum putleri*, ♀. 1, Habitus (ac = acetabular carina; ec = epicnemial carina). 2, Head and thorax, dorsal view. 3, Head, frontal view. 4, Thorax, ventral view (mk = metasternal keel; 3 = hindcoxal cavity; 2 = midcoxal cavity). 5, Forewing, dorsal view (setae on undersurface indicated by dots).



Figs. 6-7. *Edovum putleri*, antenna. 6, ♀. 7, ♂ (setae not shown, similar to female).

depression that separates the forecoxae from the midcoxae. The mesosternum is distinctly angulate between the pairs of coxae. In other genera, there is at most a slight groove corresponding to the epicnemial carina, there is no acetabular carina, and the mesosternum slopes evenly from fore- to mid-coxa without the formation of a forecoxal depression. The terms epicnemial carina and acetabular carina are used in the sense of Richards (1977) and define diagnostic structures that have seldom been referred to in the Chalcidoidea.

Another character apparently unique to *Edovum* is the presence between the hindcoxae of a forked metasternal keel (Fig. 4, mk), which is continuous with the propodeal foramen (including nucha). In other entedontines, either there are no structures between the coxae or there are weak carinae that approach the foramen but do not join with it.

The above characters are enough to distinguish *Edovum* as structurally unique. A combination of other characters that make it even more distinct are the following: Eyes converging strongly below, V-shaped frontal groove joined by scrobal grooves, curved (not angled) vertex, notauli deeply impressed for entire length, scutellum with a basal median groove, propodeum

medially not projecting as a neck beyond the hindcoxae, and first abdominal tergum covering about three-fourths length of abdomen.

Placement of *Edovum* in relation to other genera is rather problematical. Until the Entedontinae are revised, however, I suggest that the thoracic structure of *Edovum* is sufficiently distinct to isolate it taxonomically from all other genera.

*Edovum puttleri* Grissell, NEW SPECIES

Holotype female.—Body length 1.6 mm. Black except ivory colored are: Scape, legs beyond coxae, wing veins; antenna past scape brown. Ratio ocellular length : postocellus : postocellar length as 5:4:9, ratio upper to lower interocular distances to eye height as 26:14:31, scrobal basin confined to middle  $\frac{1}{3}$  of face, clypeus slightly swollen with free edge weakly upturned, in side view malar distance  $\frac{1}{6}$  eye height (5:32), scape reaching midway to median ocellus, length less than eye width (13:15), ratio scape : pedicel : F1 : F1 : F3 : club as 13:6:6:6:5:11 (Fig. 6); occiput shagreened to finely reticulate with sculpture extending over vertex and reticulations becoming somewhat larger on face above toruli, postocellar depression aciculate, polished are: Supraclypeal area including interantennal triangle, clypeus, dorsal area of scrobes above frontal groove; face and vertex with sparse setae. Dorsomedian strip behind pronotal groove polished, groove and dorsolateral corners shagreened changing to longitudinal reticulation laterally, thorax dorsally (except axillae) with conspicuous reticulation that becomes effaced in posterior  $\frac{1}{3}$  of notaulus (i.e., notaular depression), basal  $\frac{1}{4}$  of scutellum with sculpture less developed than apex, axillae with aciculate to reticulate sculpture, side of thorax polished except following areas shagreened: Prepectus, mesosternal depression, mesopleural depression (somewhat hour-glass shaped), metasternum; the following areas lightly aciculate: Lower posterior area of mesopleuron, inner aspects of coxae (otherwise highly polished); propodeum (Fig. 1, 2) with median carina flattened, slightly elevated in profile, polished, area on either side depressed, upper  $\frac{1}{3}$  shallow transverse polished pit, lower  $\frac{2}{3}$  with shagreened longitudinal pit that continues around nucha, median areas highly polished with deep dorsolateral fovea, areas set off laterally by shagreened, longitudinal sulcus; spiracle on flattened polished plane with 6 setae laterally, otherwise lateral area of propodeum shagreened on upper and lower parts, polished between; wing (Fig. 5) ratio of submarginal : marginal : stigmal : postmarginal veins as 27:48:3:3, costal cell without setae, basal  $\frac{1}{3}$  of wing without setae on underside and above sparsely setose, 1 seta in area below submarginal vein. Abdominal terga 1–7 in ratio of 45:5:3:3:3:3:2 (longest dorsal view of each tergum), tergum 1 basally depressed, anterior  $\frac{1}{3}$  polished and asetose, posterior  $\frac{2}{3}$  with elongate pits (medially ca. own long diameter apart) interspersed with setae, remaining terga alutaceous with transverse setal row.



Allotype male.—Body length 1.4 mm. Very similar to female except in following characters: Ratio scape : pedicel : F1 : F2 : F3 : F4 : club as 15:6:5:5:5:5:6 (Fig. 7); scutellum polished or with effaced sculpture in basal  $\frac{1}{2}$ ; abdominal terga 1–7 in ratio of 42:2:2:4:4:4:2 basal  $\frac{1}{2}$  of tergum 2 polished.

Holotype.—♀, USNM type no. 100070, South America, Colombia, Medellin, 27-II to 3-III-1980, B. Puttler, ex *Leptinotarsa undecimlineata* on *Solanum saponaceum* Duy.

Allotype and paratypes.—Allotype ♂, 21 ♀ and 5 ♂ paratypes with same data as for holotype; 15 ♂ paratypes, F<sub>1</sub> generation of above, reared in United States, Missouri, Columbia, III-1980, ex *Leptinotarsa decemlineata* (Say). Material in USNM except 4 ♀, 4 ♂ paratypes in British Museum (Natural History), and 3 ♀, 3 ♂ paratypes in Museo de La Plata, La Plata, Argentina.

Other material examined.—25 specimens, South America, Colombia, Palmira (Valle), 19-25-II-1980, B. Puttler, same host as for holotype. Material at USDA, Biological Control of Insects Research Unit, Columbia, Missouri.

Hosts.—Occurring naturally in eggs of *Leptinotarsa undecimlineata*, but successfully cultured in the laboratory in eggs of the Colorado potato beetle, *L. decemlineata*.

Variation.—Size range is minimal in this species with females ranging from 1.3 to 1.6 mm and males from 1.2 to 1.5 mm. The 50 or 60 specimens examined are remarkably constant in coloration and morphology except for the abdomen. Abdominal tergum 1 remains unmodified after death, but terga 2–7, being relatively shorter and slightly telescopic, tend to vary in relation to each other and to tergum 1. In females tergum 1 is at least three-quarters the length of the abdomen and sometimes as much as nine-tenths. In males tergum 1 is usually about three-quarters but in a few specimens only about one-half the length of the abdomen. In these few specimens, the second tergum is extended four or five times the normal length with terga 3–7 remaining relatively unchanged. For comparative purposes the length of tergum 1 should be given in relation to some fixed structure such as the propodeum rather than to the remainder of the abdomen. There may be 1 to 3 setae basally on the wing beneath the submarginal vein.

Etymology.—Named in recognition of Ben Puttler and his work in biological control.

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#### NOTICE OF A NEW PUBLICATION

*The Flower Flies of the West Indies (Diptera: Syrphidae)*. By F. Christian Thompson, Systematic Entomology Laboratory, IIBIII, Agricultural Research Service, U.S. Department of Agriculture, Washington, D.C. Memoirs of the Entomological Society of Washington, Number 9, 200 pp. Cost, \$10.00.

A taxonomic analysis of the flower flies of the West Indies is presented and includes keys and illustrations for 27 genera and 129 species. Complete bibliographies and synonymies are given for each species, and extensive discussions are provided for many. The economic importance, distribution, and taxonomy of these flies are discussed. Twenty new species and one new subgenus are described, and 46 new synonymies are proposed.

This publication can be ordered from the Custodian, Entomological Society of Washington, % Department of Entomology, Smithsonian Institution, Washington, D.C. 20560.